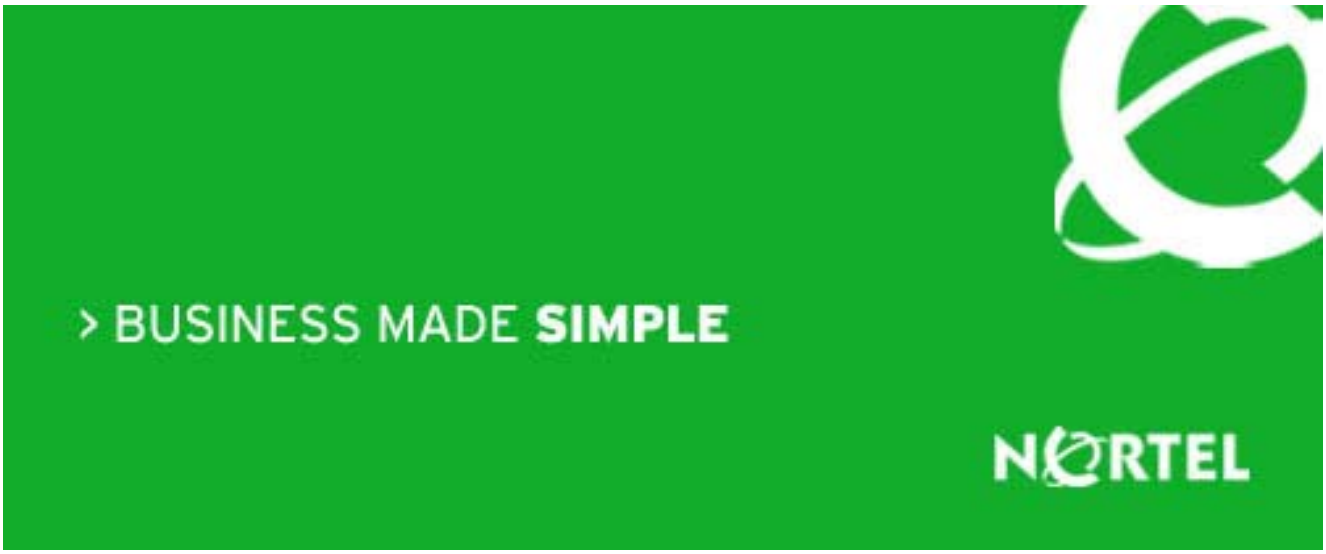

Business Communication Manager Interoperability with Communication Server 1000 and Meridian 1 IP Trunk

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Version	Date	Reason for Release
1.0	Dec 2003	Introduction of BCM 3.5 and Communication Server 1000Rls 3.0
2.0	June 2004	Introduction of BCM 3.6
3.0	March 2005	Update to include Communication Server 1000 Rls 4.0
4.0	May 2005	Update to include BCM 3.7 and BCM50
5.0	Nov 2006	Update to include BCM 4.0, BCM50R2, Communication Server 1000 Rls 4.5

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Business Communications Manager Interoperability with Communication Server 1000 and Meridian 1 with IP Trunk

Table 1 and Table 2 represent the H.323 and SIP trunk interoperability, respectively, between various software releases of the Business Communications Manager (BCM), the Communication Server 1000, and Meridian 1 IP Trunk (formerly known as ITG Trunk) products. Blank cells indicate an unsupported configuration. Table 3 provides a summary of the PEPs and BCM Patches that are applicable to interoperability between the products. **Table 4** and Table 5 provide a list of specific features that are supported between the latest releases of the BCM (i.e. 4.0 / BCM50R2, and 3.7 / BCM50) with the Communication Server 1000 Rls 4.5 / 4.0, and Meridian 1 IP Trunk 3.01 releases, respectively. Similarly, **Table 6** and Table 7 identify the known issues that exist between the latest BCM releases and the Communication Server 1000 Rls 4.5 and 4.0, and IP Trunk 3.01 releases, respectively. Table 8 provides additional detail into codec configuration rules and diagnostic information.

Note: In this document, "CS1000 4.0" or "CS1000 4.5" refers to Communication Server 1000 Release 4.0 or 4.5 respectively.

Note: Except where otherwise specifically noted in the document, the Survivable Remote Gateway (SRG) interoperability is the same as the corresponding BCM 3.7, BCM 4.0, BCM50R1 or BCM50R2 release.

Table 1: H.323 Interoperability by Software Release

	BCM3.5	BCM 3.6	SRG 1.0	BCM 3.7	BCM50 R1	BCM 4.0	BCM50 R2
Succession 1000 Rls 2	*Supported*						
Meridian 1 IP Trunk 3.0	*Supported*						
Meridian 1 or Succession 1000M w/ IP Trunk 3.01	*Supported*	*Supported*		*Supported*	*Supported*	*Supported*	*Supported*
Succession 3.0 (using Signaling Server 2.10.81)	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*		
Succession 3.0 (using Signaling Server 2.11.03)	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*		
Communication Server 1000 Rls 4.0	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*
Communication Server 1000 Rls 4.5	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*	*Supported*

Table 2: SIP Interoperability by Software Release

	BCM 4.0	BCM50 R2
Communication Server 1000 Rls 4.0	*Supported*	*Supported*
Communication Server 1000 Rls 4.5	*Supported*	*Supported*

Table 3: Interoperability Patch Reference Table

	BCM 3.7	BCM50R1	BCM 4.0	BCM50R2
Meridian 1 or Succession 1000M IP Trunk 3.01	T1, T2, B1, B3	T1, T2, B2, B3	T1, T2, B3	T1, T2, B3
Communication Server 1000 Rls 4.0	S1, B1, B3	S1, B2, B3	S1, B3	S1, B3
Communication Server 1000 Rls 4.5	S1, B1, B3	S1, B2, B3	S1, B3	S1, B3

Succession Patch References:

Reference	Patch ID	Status
S1	Refer to Nortel Enterprise Solutions PEP Library (http://www.nortel.com/espl) for Core and Interop DepLists	

Meridian 1 with IP Trunk Patch References:

Reference	Patch Name	Status
T1	MPLR18316	Optional (Required to allow V.34 fax machines to revert to G3 operation for T.38) *Note: This has been fixed in IP Trunk upissue 3.01.52*
T2	MPLR17721	Required when MCDN not configured on BCM *Note: This has been fixed in IP Trunk upissue 3.01.09*

BCM Patch References:

Reference	Patch Name	Status
B1	BCM370.175-FEPS (FEPS 37.222.0.33)	Generally Available.
B2	BCM050.108-FEPS (FEPS: 40.330.0.33)	Generally Available.
B3	Refer to the BCM Software Downloads web site at www.nortel.com (by following Support and Training, Technical Support, Software Downloads) for latest BCM patch information.	

Table 4: Supported H.323 Functionality - BCM and Communication Server 1000 Release 4.0 and 4.5

Supported Functionality (with CS1000 4.0 and 4.5)	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
CS1000 4.0/45 Network Routing Server (NRS)	Registration: • Registers as an H.323 Endpoint	*Supported*	*Supported*
	Signaling method: • Gatekeeper Resolved	*Supported*	*Supported*
	Alternate Gatekeeper	*Supported* (Programmable)	*Supported* (Programmable)
Succession 4.0/4.5 IP Peer Gateway (Signaling Server)	H.225 Call Signaling (using Nortel Interoperability format) H.245 Media Channel Signaling	*Supported*	*Supported*
H.323 Basic Call	Call connection with Calling Line ID	*Supported*	*Supported*
Private Dial Plan	CDP dial plan	*Supported*	*Supported*
	UDP dial plan	*Supported*	*Supported*
	• BCM private dial plan can only be configured for either CDP or UDP, not both simultaneously.		
MCDN Networking	**Applications:**		
	The following are typical applications that can be supported using MCDN features: • Centralized Voicemail, • Central Attendant (Basic), • Centralized Trunking	*Supported*	*Supported*
	MCDN Features:		
	Private Name/Number	*Supported*	*Supported*
	Trunk Anti-Tromboning (TAT) ** Refer to Table 6*	*Supported**	*Supported (See note)*
	Notes: • BCM 4.0 and BCM50R2 have enhanced the BCM TAT implementation to enable TAT support on CTI based calls (eg. calls using BCM AutoAttendant functionality).		
	Trunk Route Optimization: • Before Answer (TRO-BA) • Call Modification (TRO-CM) ** Refer to Table 6*	*Supported** *Not Supported**	*Supported** *Not Supported**
	Network Call Redirection	*Supported*	*Supported*
	Message Waiting Indication (MWI)	*Supported*	*Supported*
	Message Indicator Key (MIK)	*Supported*	*Supported*
	Message Cancel Key (MCK)	*Supported*	*Supported*
	Station Camp-on	*Supported*	*Supported*
	Barge-In	*Supported*	*Supported*
	ISDN Call Connection Limit (ICCL)	*Supported*	*Supported*
	Notes: • On the BCM, these capabilities are enabled via the Nortel Voice Networking (MCDN) keycode. The BCM Gateway Protocol must be set to "CSE".		
T.38 Fax	Fax detection during H.323 call; renegotiation to T.38 ** Refer to Table 6*	*Supported**	*Supported**

Supported Functionality (with CS1000 4.0 and 4.5)	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
Overlap Signaling	Ability for the CS1000 to be configured to use Overlap Signaling on call setup.	*Supported*	*Supported*
	Notes: • The BCM will interoperate with the CS1000 when the CS1000 has been configured to use Overlap Signaling. However, the BCM rejects the Overlap Signaling call setup attempts and requires Enbloc Signaling to be used.		
H.245 Tunneling	H.245 messages use existing H.225 connection (instead of new TCP connection)	*Supported*	*Supported*
	Notes: • By default, CS1000 4.0 will attempt to use H.245 tunneling. If the BCM is configured for its' default setting (H.245 Tunneling: Off), then it negotiates with the CS1000 to turn H.245 tunneling off. • The BCM data services (NAT and Firewall) do not support H.323 when H.245 Tunneling is configured.		

Table 5: Supported H.323 Functionality between BCM and Meridian 1 with IP Trunk 3.0x

Supported Functionality (with IP Trunk 3.0x)	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
Network Routing Server (NRS) *Note that NRS can refer to the NRS on CS1000 Rls 4.5 or 4.0*	Registration: • Stand-alone or Co-resident GK	*Supported*	*Supported*
	Signaling method (to IP Trunk 3.01 nodes registered with the NRS) • Gatekeeper Resolved	*Supported*	*Supported*
	Alternate NRS (Stand-alone or Co-resident): • IP Address received during the registration process	*Supported* (Programmable)	*Supported* (Programmable)
IP Trunk 3.01 Node Registered with NRS as H323 Endpoint	H.225 Call Signaling using: • Direct routed to standard UDP port (15000) • NRS to resolve destination telephone number • **Nortel Networks Interoperability format** capability, including GK-resolved MCDN Non-Call-Associated Signaling (NCAS).	*Supported*	*Supported*
	Notes: • The BCM H.323 Gatekeeper Settings tab should have the Gateway Protocol set to "CSE". • BCM supports the Redirect FACILITY message that IP Trunk 3.01 Node Leader uses to redirect all incoming calls to a reserved trunk resource in the node. • BCM supports codec negotiation with IP Trunk 3.01 using Fast Start signaling elements and H.245 Media Path signaling. • BCM side (Node B) initiates H.245 Media Channel Signaling for direct media path between IP Trunk 3.01 nodes (A and C) that have a tandem IP Trunk call signaling connection via the BCM (Node B). • IP Trunk 3.01 side (Node B) never initiates H.245 Media Channel Signaling for direct media path between BCM nodes (A and C) that have a tandem IP Trunk call signaling connection via IP Trunk 3.01 (Node B).		
IP Trunk 3.01 Node Not Registered with NRS	*H.225 Call Signaling using:* • Direct routed to standard TCP port • Local BCM and IP Trunk dialing plan to resolve the destination telephone number, • **ITG ISDN IP Trunk format**. *MCDN NCAS using:* • Direct routed to a proprietary TCP port • Local BCM and IP Trunk dialing plan to resolve the destination telephone number.	*Supported*	*Supported*
	Notes: • The BCM should be configured to use "CSE" as the Gateway Protocol in the BCM Remote Gateway Table. The IPT should be configured to use "CSE" mode in the dial plan table. • BCM supports the Redirect FACILITY message that IP Trunk 3.01 Node Leader uses to redirect all incoming calls to a reserved trunk resource in the node. • BCM supports codec negotiation with IP Trunk 3.01 using Fast Start signaling elements and H.245 Media Path signaling. • BCM side (Node B) initiates H.245 Media Channel Signaling for direct media path between IP Trunk 3.01 nodes (A and C) that have a tandem IP Trunk call signaling		

Supported Functionality (with IP Trunk 3.0x)	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
IP Trunk 3.01 Node Not Registered with NRS (cont'd)	connection via the BCM (Node B). • IP Trunk 3.01 side (Node B) never initiates H.245 Media Channel Signaling for direct media path between BCM nodes (A and C) that have a tandem H.323 Trunk call signaling connection via IP Trunk 3.01 (Node B). • IPT 3.0x systems require a PEP (reference T2 in Table 3) when networked with BCMs that do not have MCDN functionality activated.		
	QoS Monitor for Fallback to PSTN	*Supported*	*Supported*
	Notes: • In direct call signaling mode on the BCM, remote gateway table entries in the Element Manger give the options to enable QoS and set thresholds. For BCM50R1, BCM50R2 and BCM 4.0 systems, in order for any calls to the IP Trunk 3.01 to succeed when QoS is enabled on a remote gateway entry, a second remote gateway row may be required. The first remote gateway entry is provisioned with the IPT's Node IP. If the Node IP is different from the Card IP, a second remote gateway table row must be added containing the Card IP of the IPT card. QoS must be enabled for this new entry. (This additional entry is not required for BCM 3.7.) Note that this requires using different Destination Digits in the second remote gateway entry, which will in turn require the routing tables to be modified to include these digits as well.		
H.323 Basic Call	Call connection w/ Calling Line ID	*Supported*	*Supported*
Private Dial Plan	CDP dial plan	*Supported*	*Supported*
	UDP dial plan	*Supported*	*Supported*
	• BCM private dial plan can only be configured for either CDP or UDP, not both simultaneously.		
MCDN Networking	**Applications:**		
	The following are typical applications that can be supported using MCDN features: • Centralized Voicemail, • Central Attendant (Basic), • Centralized Trunking	*Supported*	*Supported*
	Features supported:		
	Private Name/Number	*Supported*	*Supported*
	Trunk Anti-Tromboning (TAT) ** Refer to Table 7*	*Supported**	*Supported (See note)*
	Notes: • BCM 4.0 and BCM50R2 have enhanced the BCM TAT implementation to enable TAT support on CTI based calls (eg. calls using BCM AutoAttendant functionality).		
	Trunk Route Optimization: • Before Answer (TRO-BA) • Call Modification (TRO-CM) ** Refer to Table 7*	*Supported** *Not Supported**	*Supported** *Not Supported**
	Network Call Redirection	*Supported*	*Supported*
	Message Waiting Indication (MWI) *(Using call server RCAP of MWI)*	*Supported*	*Supported*
	Message Indicator Key (MIK)	*Supported*	*Supported*
	Message Cancel Key (MCK)	*Supported*	*Supported*
	Station Camp-on	*Supported*	*Supported*
	Barge-In	*Supported*	*Supported*
	ISDN Call Connection Limit (ICCL)	*Supported*	*Supported*

Supported Functionality (with IP Trunk 3.0x)	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
T.38 Fax	Fax detection during H.323 call and renegotiation to T.38	*Supported*	*Supported*

Table 6: Known H.323 Interop Issues Between BCM and CS1000 Release 4.5 and 4.0

Known Issues with CS1000 4.5 and 4.0	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
Support for Multiple Codecs, Payload Sizes	**Advertised Codec Payload Configuration**	*Supported*	*Supported*
	Notes: • As per the previous release(s) of BCM, CS1000, and Meridian 1 with IP Trunk, for optimum BCM to Communication Server 4.5/4.0 and IP Trunk 3.01 interoperability, the codec settings must be coordinated for all H.323 and Unistim endpoints in the network, particularly if H.323 tandem call scenarios are anticipated (such as blind transfers). Payload sizes must match across the network. • Refer to Table 8 for details on codec configuration rules and diagnostic information.		
T.38 Fax over IP	**T. 38 Fax detection & renegotiation**	*Supported*	*Supported*
	Notes: • Note that BCM and IP Trunk 3.01 allow the use of V.34 based faxed machines, (although they do reject V.34 negotiation attempts) while CS1000 does not.		
MCDN Networking:	**TRO - BA (Before Answer):** (Pre -Succession 3.0 feature)	*Supported*	*Supported*
	TRO - CM (Call modification) (New Succession 3.0 feature)	*Partially Supported*	*Partially Supported*
	Notes: • TRO-CM works as follows in a mixed Succession 4.0/3.0 and BCM VoIP environment: o When BCM is a transferring party node (B), not an originating or terminating node (A or C), TRO-CM works and both the Media and Signaling are direct (A to C). o If BCM is originating or terminating node (A or C), TRO-CM does not work; the Media is direct (A to C), but a tandem Signaling path is maintained (A to B to C). o TRO-CM does not work in Succession 4.0/3.0 for Blind Transfer calls to a station that is Call Forward No-Answer. The transferring user must remain on the transferred call until it is answered to ensure that TRO-CM will optimize the call when the Call Transfer is completed. o TRO – BA and TRO – CM depend on implementation of a perfectly coordinated (CDP) and/or uniform (UDP) dialing plan across all nodes in the private IP Telephony network. o All Succession 4.0/3.0 and IP Trunk 3.01 routes must be configured to enable automatic insertion of UDP access codes (INAC = YES) in order for UDP Location Codes to work with TRO. All nodes must send TRO-BA Offer and TRO-CM Invoke messages with the correct NPI/TON values for the destination telephone number. o In Succession 4.0/3.0 and Meridian 1 with IP Trunk, all network translations where TRO is required must point to a Route List Block (RLB) with an ENTR 0 that contains an IP Peer Virtual Trunk or IP Trunk 3.01 route with idle trunk members o		
	Trunk Anti-Tromboning (TAT) (Pre -Succession 3.0 implementation)	*Supported*	*Supported*
	Trunk Anti-Tromboning (TAT) (Succession 3.0 enhancement)	*BCM 3.7:* *Supported* *BCM50R1:* *Not directly Supported* *(See notes)*	*Supported*

Known Issues with CS1000 4.5 and 4.0	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
MCDN Networking: (cont'd)	Notes: • BCM50R1 does not support the TAT and NAS enhancement of the Nortel Networks H.323 Interoperability format that was introduced in Succession 3.0 and IP Trunk 3.01 to accurately validate the trombone condition by comparing the unique gateway id (MAC address or IP address) in the extended TAT information element in the non-standard data of the H.225 Setup, Alerting, and Facility messages. The following text describes what is necessary for TAT to function between these versions of BCM and the Communication Server 4.5/4.0 and/or IP Trunk 3.01 call servers. • In the absence of the extended TAT IE in H.225 messages received from BCM, Communication Server 4.5/4.0 and IP Trunk 3.01 D-Channel/H.323 Gateway falls back to comparing the Called and Calling numbers on the outgoing and incoming side of the tromboned trunk connection. • If the Called and Calling numbers on the two sides of the call don't match, then the TAT Invoke message from BCM is discarded regardless of matching Call Reference. This prevents wrong connections that can occur due to false TAT optimization when Call References assigned by different Gateways across the network randomly matched for unrelated calls. • Incoming calls to BCM that are answered and transferred within the BCM before being routed in a trombone connection back to Communication Server 4.5/4.0 or IP Trunk 3.01 will not be optimized by TAT because the Called and Calling numbers do not match on the two sides of the tromboned call. • In a private IP telephony voice network with mixed CDP Steering Codes and UDP Location Codes, incoming calls to BCM that are forwarded using a different type of number in a trombone connection back to Communication Server 4.5/4.0 or IP Trunk 3.01 will not be optimized by TAT because the Called and Calling numbers do not match on the two sides of the tromboned call. • BCM sets up a direct media path between the two ends of the tromboned connection, but this can still result in multiple transcoding and voice quality degradation due to media path loopback via Communication Server 4.5/4.0 Voice Gateway Media Cards or IP Trunks.		
	Interop with ESN5 Signaling	*Not Supported*	*Not Supported*
	Notes: • Communication Server 4.5/4.0 and Meridian 1 with IP Trunk use ESN5 signaling with MCDN to signal the Network Class of Service (NCOS) of the originating terminal among Succession 4.0/3.0 nodes in order to control access to PSTN trunk facilities at a remote Call Server and Media Gateway. • The Nortel Networks Interoperability format introduced in Succession 2.0 supports an extended ESN5 Information Element in the Non-standard data of the H.225 Call Setup message, but BCM does not send optional ESN5 Information Element in the H.225 Call Setup message. • If ESN5 signaling is enabled on a Succession 4.0/3.0 IP Peer virtual trunk route, you must configure an appropriate default NCOS value for incoming calls in Element Manager from BCM to a Virtual Trunk route that has ESN5 signaling enabled. • Succession 4.0/3.0 IP Peer H.323 Gateways insert a default NCOS value in the ESN5 prefix for calls received from BCM without the extended ESN5 information element.		
	VPNI IE for Bandwidth Management Zone signaling	*BCM:* *Not Supported* *SRG:* *Partially Supported*	*BCM:* *Not Supported* *SRG:* *Partially Supported*

Known Issues with CS1000 4.5 and 4.0	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
	Notes: • Communication Server 4.5/4.0 provides an optional MCDN Information Element that signals the Virtual Private Network Identifier and the Bandwidth Management Zone over IP Peer Virtual Trunk routes to allow Call Servers to coordinate codec selection appropriately for different Internet Telephones depending on network location. This VPNI IE is not generated or used on BCM systems. In SRG mode, this VPNI IE is generated so that the Communication Server 4.5/4.0 can determine which zone calls are originated or destined for bandwidth management. However, SRG does not process any incoming VPNI IE and does not provide bandwidth management capabilities.		
Network Routing Server Functionality (NRS)	**Failover to Alternate**	*Supported*	*Supported*
	Maintenance switchover to Alternate	*Not Supported*	*Not Supported*
	Graceful recovery to Primary	*Supported*	*Supported*
	Notes: • BCM uses the Registration Time-To-Live (TTL) value in the BCM Gatekeeper settings to establish the point at which re-registration is attempted. If no response is received from the primary NRS, the BCM will send up to two additional registration requests, each 12 seconds apart, at which point the alternate NRS registration process is initiated, with a total elapsed time 24 seconds longer than the TTL setting. • The Communication Server NRS also supports a mechanism to instruct gateways to switch to the Alternate NRS for maintenance purposes. Communication Server 4.5/4.0 gateways and IP Trunk 3.01 nodes will re-register to the Alternate GK almost immediately, while the BCM will treat the condition as a failure, and use the Alternate NRS failover procedures identified above.		

Table 7: Known H.323 Interop Issues between BCM and Meridian 1 with IP Trunk 3.0x

Known Issues with Meridian 1 with IP Trunk 3.0x	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
Support for Multiple Codecs, Payload Sizes	**Advertised Codec Payload Configuration**	*Supported*	*Supported*
	Notes: • As per the previous release(s) of BCM, CS1000, and Meridian 1 with IP Trunk, for optimum BCM to Communication Server 4.5/4.0 and IP Trunk 3.01 interoperability, the codec settings must be coordinated for all H.323 and Unistim endpoints in the network, particularly if H.323 tandem call scenarios are anticipated (such as blind transfers). Payload sizes must match across the network. • Refer to Table 8 for details on codec configuration rules and diagnostic information.		
T.38 Fax over IP	**T. 38 Fax detection & renegotiation**	*Supported*	*Supported*
	Notes: • Note that BCM and M1 with IP Trunk 3.01 allow the use of V.34 based faxed machines, (although they do reject V.34 negotiation attempts) while Communication Server 1000 does not.		
MCDN Networking	**TRO - BA (Before Answer):** (Pre -Succession 3.0 feature)	*Supported*	*Supported*
	TRO - CM (Call modification) (New Succession 3.0 feature)	*Partially Supported*	*Partially Supported*
	Notes: • TRO-CM feature works as follows in a mixed Meridian 1 with IP Trunk 3.0x and BCM VoIP environment: • When BCM is a transferring party node (B), not an originating or terminating node (A or C), both the Media and Signaling are direct (A to C). • When BCM is an originating or terminating node (A or C), the Media and the Signaling path is maintained between the three sites.		
	Trunk Anti-Tromboning (TAT) (Pre -Succession 3.0 implementation)	*Supported*	*Supported*
	Trunk Anti-Tromboning (TAT) (Succession 3.0 enhancement)	*BCM 3.7:* *Supported* *BCM50:* *Not directly Supported*	*Supported*
	Notes: • BCM50R1 does not support the TAT and NAS enhancement of the Nortel Networks H.323 Interoperability format that was introduced in Communication Server 3.0 and IP Trunk 3.01 to accurately validate the trombone condition by comparing the unique gateway id (MAC address or IP address) in the extended TAT information element in the non-standard data of the H.225 Setup, Alerting, and Facility messages. The following text describes what is necessary for TAT to function between these versions of BCM and the Communication Server 4.5/4.0 and/or IP Trunk 3.01 call servers. • In the absence of the extended TAT IE in H.225 messages received from BCM, Communication Server 4.5/4.0 and IP Trunk 3.01 D-Channel/H.323 Gateway falls back to comparing the Called and Calling numbers on the outgoing and incoming side of the tromboned trunk connection. • If the Called and Calling numbers on the two sides of the call don't match, then the TAT Invoke message from BCM is discarded regardless of matching Call Reference.		

Known Issues with Meridian 1 with IP Trunk 3.0x	Description	BCM 3.7 and BCM50R1	BCM 4.0 and BCM50R2
	This prevents wrong connections that can occur due to false TAT optimization when Call References assigned by different Gateways across the network randomly matched for unrelated calls. • Incoming calls to BCM that are answered and transferred within the BCM before being routed in a trombone connection back to Communication Server 4.5/4.0 or IP Trunk 3.01 will not be optimized by TAT because the Called and Calling numbers do not match on the two sides of the tromboned call. • In a private IP telephony voice network with mixed CDP Steering Codes and UDP Location Codes, incoming calls to BCM that are forwarded using a different type of number in a trombone connection back to Communication Server 4.5/4.0 or IP Trunk 3.01 will not be optimized by TAT because the Called and Calling numbers do not match on the two sides of the tromboned call. • BCM sets up a direct media path between the two ends of the tromboned connection, but this can still result in multiple transcoding and voice quality degradation due to media path loopback via Communication Server 4.5/4.0 Voice Gateway Media Cards or IP Trunks.		
	Interop with ESN5 Signaling	*Not Supported*	*Not Supported*
	Notes: • Communication Server 4.5/4.0 and Meridian 1 with IP Trunk use ESN5 signaling with MCDN to signal the Network Class of Service (NCOS) of the originating terminal among Communication Server 4.5/4.0 nodes in order to control access to PSTN trunk facilities at a remote Call Server and Media Gateway. • If BCM sends H.225 Call Setup with ITG ISDN IP Trunk format, IP Trunk 3.0x does not recognize BCM as non-ESN5-signaling originating endpoint. • The IP Trunk 3.0x must be configured with a Gatekeeper-resolved Network Numbering. • If ESN5 signaling is enabled on a IPT Trunk route or upgraded Succession 1000M, you must configure an appropriate default NCOS value on the IP Trunk node for incoming calls from BCM to a Virtual Trunk route that has ESN5 signaling enabled.		

Table 8: Succession and Meridian 1with IP Trunk Codec Configuration Rules

Communication Server 4.5/4.0 Element Manager IP Telephony Node VGW Profile:	
Payload	The following are the default values of the IP Trunk 3.0x: • **G.711** payload size defaults to 20 ms • **G.729A** payload size defaults to 20 ms. • **G.723.1** payload size is fixed at 30 ms. The BCM payload size is now configurable, but does not default to these same values. For optimum interoperability of a BCM, Communication Server 4.5/4.0, and IP Trunk 3.01 network, the following rules should be adhered to: • For each BCM/SRG and CS 1000 node in the network the codec list including payload size must be identical, and the BCM/SRG should be provisioned to advertise a list of CODECS (i.e. NOT a single CODEC with the biggest payload). • BCM50 does not support G.723.1 codecs on calls terminating or originating on TDM sets or circuit-switched trunks on the BCM50, but is supported calls with two IP endpoints (H.323 to IP set or IP trunk tandem calls). • Note that the advertised payload size for BCM H.323 negotiation when the BCM endpoint is an IP set is the higher of the payload size assigned to IP Trunk codecs or IP Set codec settings.
Voice Activity Detection (VAD)	• **G.711** Silence suppression or Voice Activity Detection (VAD) is **disabled** and cannot be enabled. • **G.729A** setting on the Communication Server 1000is equivalent to "**G.729 Silence suppression disabled**" setting on the BCM (i.e. VAD is disabled). **G.729AB** setting on the Communication Server 1000is equivalent to "**G.729 Silence suppression enabled**" setting on the BCM (i.e. VAD is enabled). Both devices must be configured with equivalent settings. • **G.723.1** Silence suppression or Voice Activity Detection (VAD) is disabled and cannot be enabled. • VAD was previously referred to as Silence Suppression on BCM but was renamed to align with Communication Server 4.5/4.0 terminology.
IP Trunk 3.0x OTM 2.1 ITG ISDN IP Trunk Node Properties DSP Profile:	
Payload	The following are the default values of the IP Trunk 3.0x: • **G.711** payload size defaults to 10 ms • **G.729A** payload size defaults to 30 ms. • **G.723.1** payload size is fixed at 30 ms. • **G.729A** and **G.723.1** cannot be selected together for IP Trunk 3.0x. The BCM payload size is now configurable, but does not default to these same values. For optimum interoperability of a BCM, Communication Server 4.5/4.0, and IP Trunk 3.01 network, the following rules should be adhered to: • For each BCM/SRG and CS 1000 node in the network the codec list including payload size must be identical, and the BCM/SRG should be provisioned to advertise a list of CODECS (i.e. NOT a single CODEC with the biggest payload). • BCM50 does not support G.723.1 codecs on calls terminating or originating on TDM sets or circuit-switched trunks on the BCM50, but is supported calls with two IP endpoints (H.323 to IP set or IP trunk tandem calls). • Note that the advertised payload size for BCM H.323 negotiation when the BCM endpoint is an IP set is the higher of the payload size assigned to IP Trunk codecs or IP Set codec settings.

Voice Activity Detection (VAD)	• **G.711** Silence suppression or VAD is **disabled by default**. Verify that it remains disabled for interoperation with BCM. • **G.729A** Silence suppression (VAD) is **enabled by default**. Ensure that the VAD setting on IP Trunk matches the Silence suppression setting on BCM. • **G.723.1** Silence suppression or VAD is **enabled by default**. Ensure that the VAD setting on IP Trunk matches the Silence suppression setting on BCM. IPT 3.00 G.723.1 VAD is always enabled regardless of VAD setting. IPT 3.01 G.723.1 VAD is enabled or disabled according to the VAD setting. • VAD was previously referred to as Silence Suppression on BCM but was renamed to align with Communication Server 4.5/4.0 terminology.
Fax Setting	• **T.38** FAX and V.21 FAX tone detection is **enabled by default**. Verify that V.21 FAX tone detection remains enabled for T.38 FAX. Group 3 T.38 FAX protocol is **wrongly identified** as T.30 in OTM 2.1 ITG ISDN IP Trunk Node Properties DSP Profile General tab. Don't be misled -- the FAX protocol is T.38.
Codec Mismatch Diagnostics:	

BCM to Succession	Calls from BCM to Communication Server 4.5/4.0 with a codec mismatch are **released immediately** by Communication Server 4.5/4.0 without ringing the terminating telephone and without seizing an outgoing trunk for a tandem routed call. Succession 3.0 Overlay 96 D-Channel monitor shows the following diagnostic messages:
	
	(For incoming calls from BCM that terminate to a station or an outgoing ISDN PRI)
	`DCH 10 IMSG SETUP REF 00008021 CH 84 0 0 0 TOD 17:18:46`
	`CALLING #:1405 NUM PLAN: PRIVATE/ABBREVIATED (CDP)`
	`CALLED #:4015 NUM PLAN: PRIVATE/ABBREVIATED (CDP)`
	
	`DCH 10 OMSG REL COMP REF 00008021 CH 84 0 0 0 TOD 17:18:46`
	`CAUSE :SWED EQIP CONGESTION`
	`DIAG: 171`
	
	`(For incoming calls from BCM that terminate to a non-ISDN PRI trunk)`
	`CH 10 IMSG SETUP REF 00008001 CH 83 0 0 0 TOD 18:33:18`
	`CALLING #:1405 NUM PLAN: PRIVATE/ABBREVIATED (CDP)`
	`CALLED #:5010 NUM PLAN: PRIVATE/ABBREVIATED (CDP)`
	
	`DCH 10 OMSG REL COMP REF 00008001 CH 83 0 0 0 TOD 18:33:18`
	`CAUSE :NO CHANNEL/CIRC AVAIL`
	`DIAG: 095`

Succession to BCM	Calls from S Communication Server 4.5/4.0 to BCM with a codec mismatch **ring the terminating telephone until the call is answered, then BCM disconnects the call**. Communication Server 4.5/4.0 Overlay 96 D-Channel monitor shows the following diagnostic messages:
	
	`DCH 10 IMSG CONNECT REF 000001A1 CH 84 0 0 0 TOD 17:30:36`
	
	`DCH 10 OMSG CONN ACK REF 000001A1 CH 84 0 0 0 TOD 17:30:36`
	
	`DCH 10 IMSG DISC REF 000001A1 CH 84 0 0 0 TOD 17:30:36`
	`CAUSE :INCOMPATIBLE DEST`
	
	`DCH 10 OMSG RELEASE REF 000001A1 CH 84 0 0 0 TOD 17:30:36`
	
	`DCH 10 IMSG REL COMP REF 000001A1 CH 84 0 0 0 TOD 17:30:36`

Table 9: Supported SIP Functionality - BCM and Communication Server 1000 Release 4.0 and 4.5

Supported SIP Functionality with Communication Server 1000 Release 4.0 and 4.5	Description	BCM 4.0 and BCM50R2
Network Routing Server (NRS)	Static Registration	*Supported*
	Dynamic Registration	*Not Supported*
SIP Basic Call	Call connection with Calling Line ID	*Supported*
Private Dial Plan	CDP dial plan	*Supported*
	UDP dial plan	*Supported*
	• BCM private dial plan can only be configured for either CDP or UDP, not both simultaneously.	
MCDN Networking:	**Applications:**	
	The following are typical applications that can be supported using a combination of MCDN features and information contained in SIP messages: • Centralized Voicemail, • Central Attendant (Basic), • Centralized Trunking	*Supported*
	Features:	
	Private Name/Number	*Supported*
	Trunk Anti-Tromboning (TAT) ** Refer to Table 6*	*Supported* *(See note)*
	Notes: • BCM 4.0 and BCM50R2 have enhanced the BCM TAT implementation to enable TAT support on CTI based calls (eg. calls using BCM AutoAttendant functionality).	
	Trunk Route Optimization: • Before Answer (TRO-BA) • Call Modification (TRO-CM) ** Refer to Table 6*	 *Supported** *Not Supported**
	Network Call Redirection	*Supported*
	Message Waiting Indication (MWI)	*Supported*
	Message Indicator Key (MIK)	*Supported*
	Message Cancel Key (MCK)	*Supported*
	Station Camp-on	*Supported*
	Barge-In	*Supported*
	ISDN Call Connection Limit (ICCL)	*Supported*
	Notes: • On the BCM, these capabilities are enabled via the Nortel Voice Networking (MCDN) keycode. The BCM Gateway Protocol must be set to "CSE".	
T.38 Fax	Fax detection during SIP call; renegotiation to T.38 using UDP transport	*Supported**

Table 10: Known SIP Interop Issues - BCM and Communication Server 1000 Release 4.0 and 4.5

Known SIP Issues with CS 1000 Release 4.0 and 4.5	Description		BCM 4.0 and BCM50R2
SIP Transport Protocol	• The BCM default is UDP transport. Although the Element Manager interface displays a selection for TCP, this functionality is not currently supported. • The Communication Server 1000 Rls 4.5/4.0 default is TCP.		
Tandeming between SIP and H.323	• VAD must be enabled on all sites and codec and payload settings configured per Nortel recommendation to be able to support tandeming between a SIP and H.323 trunk on BCM. Note that this requirement is also valid for MCS5100 Rls 3.5 and Rls 3.0 interoperability. • When BCM is tandeming between SIP and H.323 IP trunks and TAT is attempted, the TAT attempt will fail. Note that this does not impact the call; the call will remain stable with direct media connection between the two endpoints but will use all of the original signaling resources for the duration of the call.		
Support for Multiple Codecs, Payload Sizes	**Advertised Codec Payload Configuration**		*Supported*
	Notes: • As per the previous release(s) of BCM, CS1000, and Meridian 1 with IP Trunk, for optimum BCM to Communication Server 4.5/4.0 and IP Trunk 3.01 interoperability, the codec settings must be coordinated for all SIP, H.323 and Unistim endpoints in the network, particularly if H.323 tandem call scenarios are anticipated (such as blind transfers). Payload sizes must match across the network.		
T.38 Fax over IP	**T. 38 Fax detection & renegotiation**		*Supported*
	Notes: • Note that BCM allows the use of V.34 based faxed machines, (although it rejects V.34 negotiation attempts) while CS1000 does not.		
MCDN Networking:	**TRO - BA (Before Answer):** (Pre -Succession 3.0 feature)		*Supported*
	TRO - CM (Call modification) (New Succession 3.0 feature)		*Partially Supported*
	Notes: • TRO-CM works as follows in a mixed Succession 4.5/4.0 and BCM SIP environment: o When BCM is a transferring party node (B), not an originating or terminating node (A or C), TRO-CM works and both the Media and Signaling are direct (A to C). o If BCM is originating or terminating node (A or C), TRO-CM does not work; the Media is direct (A to C), but a tandem Signaling path is maintained (A to B to C). o TRO-CM does not work in Succession 4.0/3.0 for Blind Transfer calls to a station that is Call Forward No-Answer. The transferring user must remain on the transferred call until it is answered to ensure that TRO-CM will optimize the call when the Call Transfer is completed. o TRO – BA and TRO – CM depend on implementation of a perfectly coordinated (CDP) and/or uniform (UDP) dialing plan across all nodes in the private IP Telephony network. o All Succession 4.5/4.0 routes must be configured to enable automatic insertion of UDP access codes (INAC = YES) in order for UDP Location Codes to work with TRO. All nodes must send TRO-BA Offer and TRO-CM Invoke messages with the correct NPI/TON values for the destination telephone number.		
	Trunk Anti-Tromboning (TAT) (Pre -Succession 3.0 implementation)		*Supported*

Known SIP Issues with CS 1000 Release 4.0 and 4.5	Description		BCM 4.0 and BCM50R2
MCDN Networking: (cont'd)	**Trunk Anti-Tromboning (TAT)** (Succession 3.0 enhancement)		*Supported*
	Interop with ESN5 Signaling		
	Notes: • Communication Server 4.5/4.0 and Meridian 1 with IP Trunk use ESN5 signaling with MCDN to signal the Network Class of Service (NCOS) of the originating terminal among Succession 4.5/4.0 nodes in order to control access to PSTN trunk facilities at a remote Call Server and Media Gateway. • The Nortel Networks Interoperability format introduced in Succession 2.0 supports an extended ESN5 Information Element in the Non-standard data of the H.225 Call Setup message, but BCM does not send optional ESN5 Information Element in the H.225 Call Setup message. • If ESN5 signaling is enabled on a Succession 4.5/4.0 IP Peer virtual trunk route, you must configure an appropriate default NCOS value for incoming calls in Element Manager from BCM to a Virtual Trunk route that has ESN5 signaling enabled. • Succession 4.5/4.0 IP Peer SIP Gateways insert a default NCOS value in the ESN5 prefix for calls received from BCM without the extended ESN5 information element.		*Not Supported*
	VPNI IE for Bandwidth Management Zone signaling		
	Notes: • Communication Server 4.5/4.0 provides an optional MCDN Information Element that signals the Virtual Private Network Identifier and the Bandwidth Management Zone over IP Peer Virtual Trunk routes to allow Call Servers to coordinate codec selection appropriately for different Internet Telephones depending on network location. This VPNI IE is not generated or used on BCM systems. In SRG mode, this VPNI IE is generated so that the Communication Server 4.5/4.0 can determine which zone calls are originated or destined for bandwidth management. However, SRG does not process any incoming VPNI IE and does not provide bandwidth management capabilities.		*BCM: Not Supported* *SRG: Partially Supported*